

## 6—1 Proportions

Ratio—compares two quantities

$$a:b \quad \frac{a}{b}$$

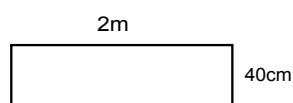
Example  
1860 students  
310 athletes

Athlete: student ratio

$$310:1860 \quad \frac{310}{1860} \quad 1:6$$

Athlete: non-athlete ratio

$$310:1550 \quad 1:5$$



Convert to  
smaller unit.

K H D Base D C M  
200

$$\begin{aligned} L:W \\ 200:40 \\ \textcircled{5:1} \end{aligned}$$

The ratio of 2 supplementary angles is 4:5.  
What are the measures of the angles?

$$\begin{aligned} 4x + 5x &= 180 \\ 9x &= 180 \\ x &= 20 \\ 4(20) &= 80^\circ \\ 5(20) &= 100^\circ \end{aligned}$$

The ratio of the angles in a triangle are 2:3:4.  
What are the measures of the angles?

$$2x + 3x + 4x = 180$$

$$9x = 180$$

$$x = 20$$

40°  
60°  
80°

The ratio of the sides of a triangle are 5:12:13.  
The perimeter is 90 cm. What are the lengths of the sides?

15cm

36cm

39cm

Proportion—equation stating 2 ratios =

$$\frac{a}{b} = \frac{c}{d}$$

“a is to b as c is to d”

means  
extremes

Product of Means = Product of the extremes

$$ad = bc$$

Examples

$$\frac{6}{18.2} = \frac{9}{y} \quad \frac{26}{3 \cdot 9} = \frac{18.2}{y}$$

$$6y = 9(18.2)$$

$$y = 27.3$$

$$\frac{(4x-5)}{3} = \frac{-26}{6}$$

$$x = -2$$

ex  
Actual  $L = 40 \text{ ft}$   
 $W = 9 \text{ ft}$

$$\frac{40}{9} = \frac{16}{x}$$

$$\frac{16}{40} = \frac{x}{9}$$

Scale  
Model  $L = 16 \text{ in}$   
 $W = ?$   
 $3.6 \text{ in}$